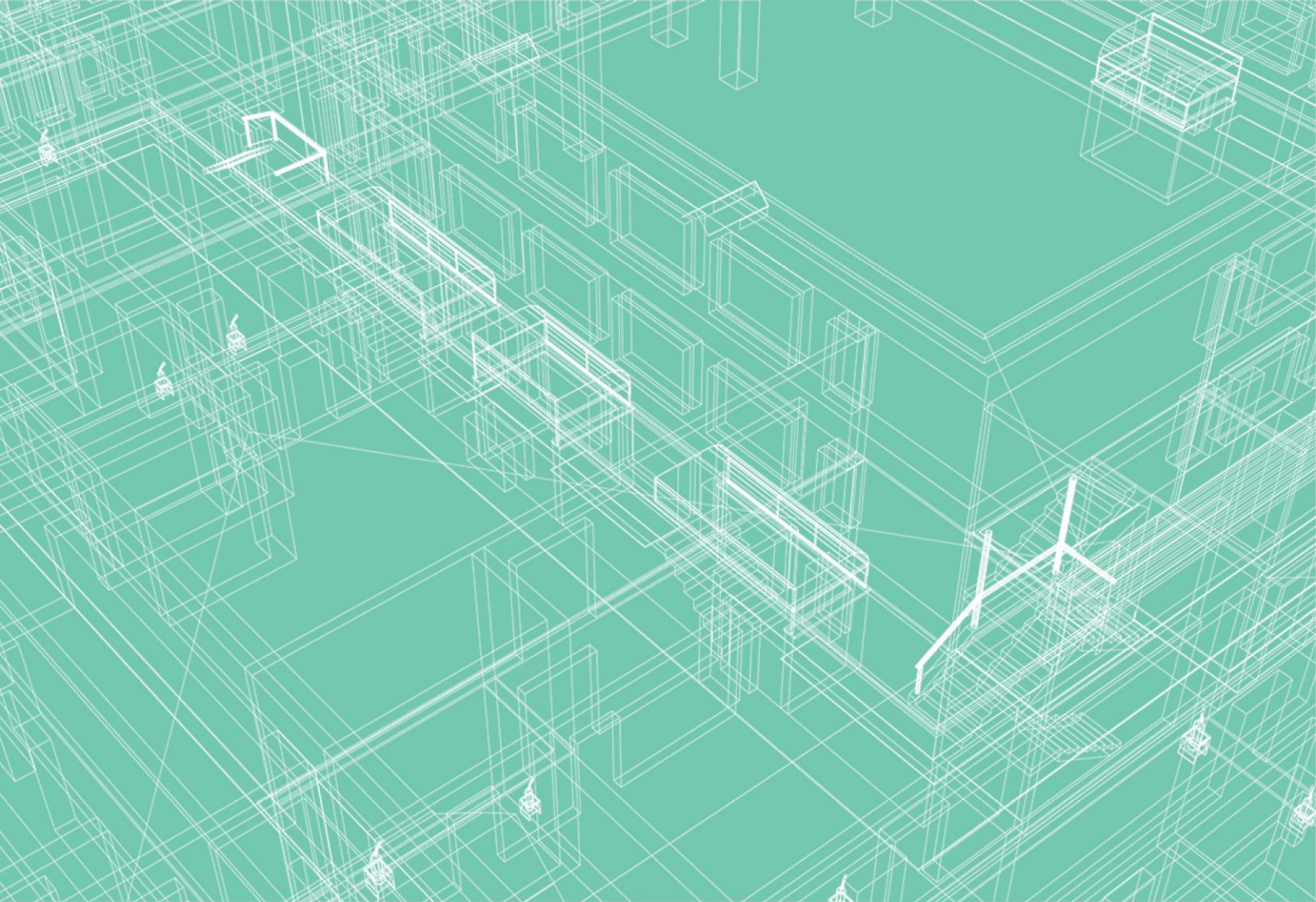
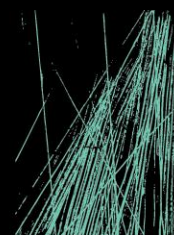




NET ZERO STATEMENT

**COMMERCIAL COMPONENT WITHIN MIXED-USE DEVELOPMENT  
16 VINE ST, REDFERN NSW 2016**

**MULTIDISCIPLINARY SERVICES**



**JHA**

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DOCUMENT CONTROL SHEET

|                |                                                      |
|----------------|------------------------------------------------------|
| Project Number | 240127                                               |
| Project Name   | Mixed Use Development   16 Vine St, Redfern NSW 2016 |
| Description    | Net Zero Statement                                   |
| Key Contact    | Todd Buncombe                                        |

Prepared By

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Revision History

| Issued to                                       | Revision | Date       |
|-------------------------------------------------|----------|------------|
| TPD Projects<br>C/O Koichi Takada<br>Architects | Rev A    | 20/09/2024 |
|                                                 | Rev B    | 31/10/2024 |
|                                                 | Rev C    | 08/11/2024 |
|                                                 | Rev D    | 19/11/2024 |

## EXECUTIVE SUMMARY

This Net Zero Statement has been prepared by JHA and the Design team for the proposed commercial component within the mixed-use development located at 2-14 Vine Street, 16-30 Vine Street and 32-34 Eveleigh Street, Redfern NSW 2016. The purpose of the Net Zero Statement is to demonstrate that the project is compliant with the Net Zero Provisions of the Sustainable Buildings SEPP.

This Statement has been developed through ongoing design and collaboration with the client and design team, with engineering design input from the mechanical, electrical and hydraulic engineers. The project has considered aspects of energy efficiency, building envelope/fabric, building systems and renewable energy with details included within. The development is designed to operate without the use of on-site fossil fuels.

The following Net Zero Statement Checklist has been included below for ease in referencing.

| Net Zero Statement Checklist                                                                                                                                                                                     | Evidence                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <b>Cover Letter</b>                                                                                                                                                                                              |                                                                                 |
| Project details and overview                                                                                                                                                                                     | Refer to Section 1 Introduction.                                                |
| Confirm if development is fossil fuel-free or requires a transition strategy.                                                                                                                                    | The development is designed to operate without the use of on-site fossil fuels. |
| Certified and signed by a mechanical or electrical engineer                                                                                                                                                      | Refer to Section 2.                                                             |
| <b>On-Site Fossil Fuel Usage</b>                                                                                                                                                                                 |                                                                                 |
| If development is fossil fuel-free: Provide evidence of fossil fuel-free operations                                                                                                                              | Refer to Section 4.                                                             |
| If development is fossil fuel dependent: Provide details of each fossil fuel system used and electrification transition strategy.                                                                                | Not Applicable.                                                                 |
| Provide evidence the development will operate without fossil fuel by 2035 by confirming it - Incorporates infrastructure or space for necessary infrastructure to transition – plant, equipment, ventilation etc | Not Applicable.                                                                 |
| <b>Energy Efficiency - Have energy reduction initiatives been described for the following?</b>                                                                                                                   |                                                                                 |
| Passive design features – building orientation, natural ventilation, insulation, glazing performance, air tightness etc.                                                                                         | Refer to Section 5.                                                             |
| Technical design features – energy efficient HVAC and lighting systems, smart controls and occupancy sensors etc                                                                                                 | Refer to Section 5.                                                             |
| <b>Renewable Energy Generation and Storage</b>                                                                                                                                                                   |                                                                                 |
| Have renewable energy or storage initiatives been described? – solar panels, photovoltaics, wind turbines etc.                                                                                                   | Refer to Section 5.                                                             |
| <b>Estimated Energy Consumption if available</b>                                                                                                                                                                 |                                                                                 |
| Estimated fossil fuel consumption per year                                                                                                                                                                       | Not Applicable.                                                                 |
| Estimated electricity consumption per year                                                                                                                                                                       | Refer to Section 6.                                                             |
| Total estimated energy consumption per year kWh/y/m2 of GFA                                                                                                                                                      | Refer to Section 6.                                                             |
| <b>Estimated GHG emissions for energy use if available</b>                                                                                                                                                       |                                                                                 |
| Estimated direct (scope 1) GHG emissions per year                                                                                                                                                                | Refer to Section 6.                                                             |
| Estimated indirect (scope 2 and 3) GHG emissions per year                                                                                                                                                        | Refer to Section 6.                                                             |
| Total estimated GHG emissions per year                                                                                                                                                                           | Refer to Section 6.                                                             |

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# 1. INTRODUCTION

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This Net Zero Statement has been prepared by JHA Consulting Engineers on behalf of Shepherd Street Pty Limited for the construction and operation of a mixed-use commercial, retail and residential development (the **proposal**) on land at 2-14 Vine Street, 16-30 Vine Street and 32-34 Eveleigh Street, Redfern (the **site**).

This report has been prepared to demonstrate that it is compliant with the Net Zero Provisions of the Sustainable Buildings SEPP. As the commercial area with NLA greater than 1,000m<sup>2</sup>, the proposed development is subjected to the requirements of Clause 35C Net Zero Statement for non-residential development under Sustainable Buildings SEPP.

This report accompanies a State Significant Development Application that seeks approval for the demolition and construction of a mixed-use commercial, retail and residential development, which includes the following:

- Demolition of the existing buildings and structures on site.
- Erection of a part 3-storey and part 5-storey retail and commercial building to the western side of the site including basement floor level commercial units and courtyard, ground floor level retail units and additional commercial units at the upper floor levels.
- Erection of a part 2-storey and part 6-storey mixed-use commercial, retail and residential building to the eastern side of the site comprising ground floor level retail units, first floor level commercial units and residential apartment units at the upper floor levels, with basement floor level car parking containing 23 standard car parking spaces including 2 accessible parking space.
- External landscaping and public space, including the provision of a through-site pedestrian link at the centre of the site connecting Hudson Street and Vine Street.
- Open communal public space and pocket park fronting Eveleigh Street to the east.

For a detailed project description, refer to the Environmental Impact Statement prepared by Ethos Urban.

## 1.1 SITE DESCRIPTION AND LOCATION

The site is located at 2-14 Vine Street, 16-30 Vine Street & 32-34 Eveleigh Street, Redfern, within the City of Sydney Local Government Area (LGA). The site extends across a broadly L-shaped configured site of approximately 2,406m<sup>2</sup> and comprises three (3) separate allotments at 2-14 Vine Street (Lot 1 in DP627353), 16-30 Vine Street (Lot 1 in DP395992) & 32-34 Eveleigh Street (Lot 2 in DP627353). The entirety of the site is under the single ownership of the Applicant.

The site location is identified in Figure 1.

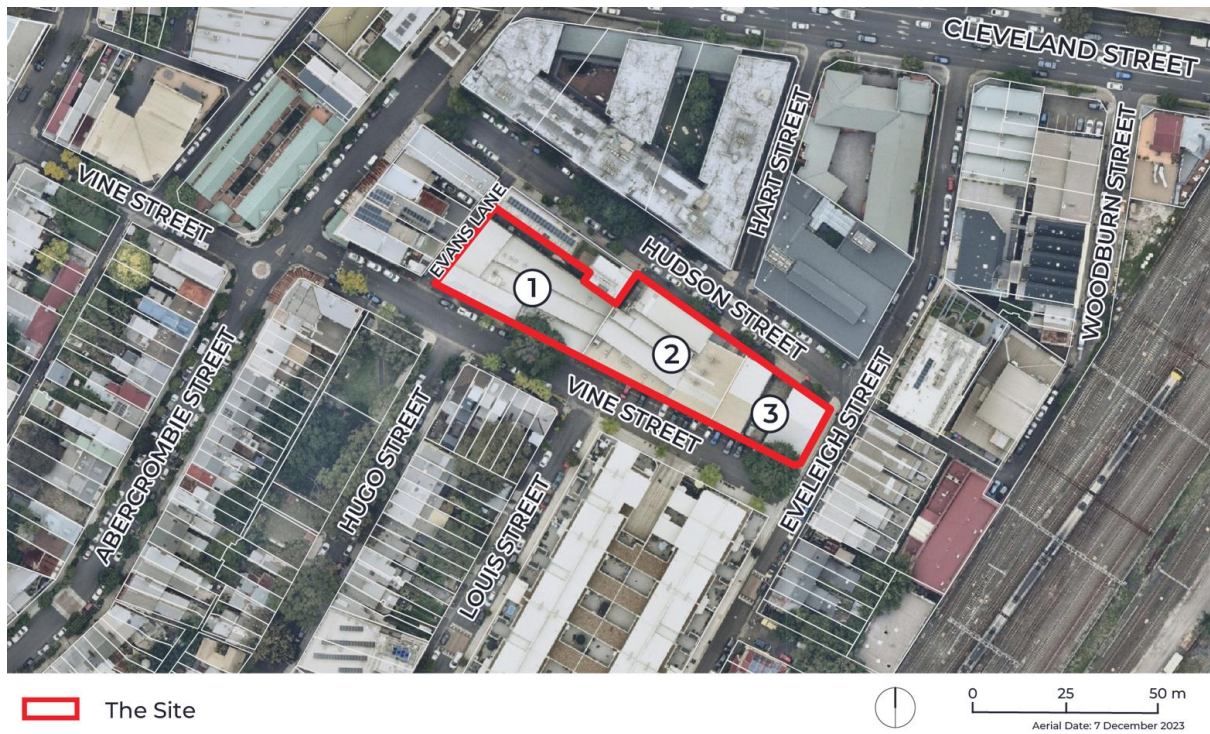


Figure 1: Aerial Image of Site, Source: Near maps, edits by Ethos Urban

## 1.2 STAKEHOLDERS CONSULTATION

The stakeholders consulted and/or contributed to the development of this Net Zero Statement are listed below.

| Stakeholders                                                                                                                                                             | Role                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| <b>TPD Projects</b><br>Todd Buncombe, Andrew McGaw                                                                                                                       | Client Representative and Project Manager                    |
| <b>Koichi Takada Architects</b><br>Richard Storey, Wen Li                                                                                                                | Architect                                                    |
| <b>JHA Consulting Engineers</b><br>Hadi Jalgha, Jeff Ng, Kishan Chand, Alex Bartley, Matthew Beament, Chris Hadjiyiannis, Gary Tang, Tarun Thottungal, Laura Golembowski | Mechanical, electrical, hydraulic, civil, fire services, ESD |

## 1.3 REFERENCE DOCUMENTS AND STANDARDS

This Net Zero Statement has been prepared in accordance with the following documents and standards:

- State Environmental Planning Policy (Sustainable Buildings) 2022
- National Carbon Offset Standard for Buildings
- NABERS The Rules: Energy and Water for Offices
- National Construction Code (NCC) Section J Energy Efficiency

## 2. CERTIFICATION OF EVIDENCE

As per Clause 35C(5) of the Sustainable Buildings SEPP, the evidence and information provided in this report must be certified by a mechanical or electrical engineer.

Details of the person who has certified the evidence and information provided in this report are as per below.

|                                          |                                                                                    |
|------------------------------------------|------------------------------------------------------------------------------------|
| <b>Full Name of Mechanical Engineer:</b> | Jeff Ng   Registered Design Practitioner NSW, DEP0000873                           |
| <b>Signature:</b>                        |   |
| <b>Qualifications:</b>                   | MIEAust CPEng (3024841), NER<br>Registered Building Design Practitioner DEP0000873 |
| <b>Address:</b>                          | Level 20, 2 Market Street SYDNEY NSW 2000                                          |
| <b>Business Telephone No:</b>            | (02) 9437 1000                                                                     |
| <b>Position</b>                          | Director (Mechanical)   JHA Consulting Engineers                                   |

### 3. OVERVIEW OF THE REQUIREMENTS

---

As of October 2023, in accordance with Clause 35C(1), the Net Zero Provisions of the Sustainable Buildings SEPP is applicable to all Non-residential State Significant Developments (SSD) and Large Commercial Developments.

Currently, Large Commercial Developments are defined as:

- Offices  $\geq 1000\text{m}^2$  net lettable area (NLA)
- Hotels or Motels  $\geq 100$  apartments

Other building types may be added at a later date.

In accordance with Clause 35C of the Sustainable Buildings SEPP, applicable projects need to provide a Net Zero Statement as part of its development application that includes the following:

- 2) The development application must include evidence that the development—
  - a) will not use on-site fossil fuels after the occupation and use of the development commence, or
  - b) incorporates the infrastructure, or space for the infrastructure, necessary for the development to not use on-site fossil fuels after 1 January 2035.

**Note** — Infrastructure includes plant, equipment and ventilation.
- 3) The development application must include details of the following—
  - a) any renewable energy generation and storage infrastructure forming part of the development,
  - b) passive and technical design features that minimise energy consumption by users of the development.
- 4) The development application must include the following information if available—
  - a) the estimated annual energy consumption for the building in kilowatt hours per square metre of floor area,
  - b) the estimated amount of emissions relating to energy use in the building, including direct and indirect emissions.

The above requirements are addressed in Sections 4, 5 & 6 of this report.

## 4. PROPOSED SYSTEMS AND EQUIPMENT

### 4.1 MECHANICAL SERVICES

The mechanical system for commercial areas is designed to operate without the use of on-site fossil fuels. Commercial tenancies are in the Basement level, Building A on the level 1 through to level 5 and Building B on the level 1. Retail tenancies are located on the ground level for both buildings. The following provisions are allowed for these tenancies.

#### WCs

Toilets and bathrooms will be provided with a dedicated ducted exhaust system with roof level discharge via duct riser. Ventilation fan operation will be via a pre-programmed time schedule. In the event of a fire alarm the toilet exhaust system will automatically shut down (subject to final air flow rate).

#### Exhaust Systems

Commercial tenant shared kitchens are to be provided with local exhaust systems to discharge to a perimeter louvre.

#### Outside Air

Outside air systems or louvre directly connected to the tenancy will be provided to supply outside air to each tenancy; flow rates or the size of the louvre will comply with the requirements of AS1668.2 / BCA requirement.

It is envisaged that the base building O/A system will be provided and sized to meet the following requirement:

- Min. O/A required for the no. of occupants as an open plan layout

Any additional O/A requirement that might arise due to any specific tenant requirement is proposed to be introduced by the respective tenant. The nominated O/A louvre at each tenancy will be provided with spare capacity to accommodate. The spare capacity will be allocated based on 0.3 L/s/m<sup>2</sup> per NLA.

#### Air Conditioning

##### Main Air Conditioning Plant – Commercial Office

The proposed air conditioning plant to the commercial office space has taken the cost effectiveness, reliability and ease of maintenance into consideration while maintaining the relevant BCA Section J and NABERS Base Building 5.5 Stars Energy target requirement.

It is anticipated that a water-cooled air-conditioning system is nominated to serve the commercial tenancies.

Main centralised mechanical plant will include for the following systems;

- Cooling towers externally mounted;
- Hot water units space heating units externally installed;
- Water cooled air conditioning system to commercial floor's ducted fan coil units located inside a plantroom in basement level;
- Associated pumps, heat exchangers and pipework;

Cooling towers are proposed to be located at Level 5. Cooling towers shall be installed within a louvred and open top plantroom.

Dedicated pipework risers will be required to serve the building, reticulating from plant areas to the respective commercial tenancies.

Condenser water pipework shall reticulate from roof level to the basement level air conditioning plantroom in a dedicated fire rated riser. The basement level plantroom shall also house the associated distribution systems.

The condenser water system will be designed to meet the base building thermal requirement based on an open plan typical office space, with spare capacity to cater for any potential tenant supplementary system that might be required due to the tenant's fitout. This supplementary condenser water loop shall be sized to cater for 20W/m<sup>2</sup> of cooling load for each commercial tenancy NLA.

Each condenser water loop connections shall be provided with thermal meters to allow for energy monitoring for billing purposes. (JHA would note that the use of thermal meters will require an agreement between the tenant and building management with regards to billing portioning).

JHA note that air cooled chiller plant can also be considered for the commercial tenancies, however, the desire is to not locate the heavy plant items on the roof of the tower. As such any air-cooled chiller would be required to be located on within the low rise plant area, where noise emissions would not impact upon the residential development above. Additionally, to achieve the targeted 5.5 stars NABERS Base Building rating, it is significantly more challenging than the higher efficiency water-cooled condenser water type system. Thus, air cooled chilled option was discounted due to these concerns.

#### On-floor Commercial Air Conditioning – Water-cooled Package Air Conditioning System

Each of the tenancies is envisaged to be provided with concealed ducted indoor AC units, connected to the main centralised mechanical plant.

Each of the air conditioning system is envisaged to be a ceiling mounted ducted concealed unit. The system will be capable of provide cooling or heating at one time, based on the respective zone's thermal requirement.

It is envisaged that each indoor AC unit will be provided to a dedicated thermal zone, to avoid the need for reheat to promote the energy efficiency. The system will be provided to each of the tenancy as a warm shell, therefore open plan layout. In general, it is anticipated that each perimeter zone facing a unique façade direction would be provided with dedicated units and the central thermal zone to be provided with a dedicated unit.

#### System Redundancy and Generator Back-up

As the development is not targeting any PCA Grade, there is no specific requirement to provide generator back up to any specific mechanical services components. The current design proposal has not made any provision for any generator back up.

### **Comms Room (Tenant)**

Supplementary tenancy cooling loops will be provided to allow tenants to connect into if required during any fitout works.

### **Waste Rooms**

The waste rooms that are in the basement will be mechanically exhausted and discharged through a dedicated shaft riser up to roof level. Waste rooms are currently proposed to be air conditioned to reduce decomposition rate, minimize odour spread and provide comfort for workers.

### **Plant Room Ventilation**

Plant rooms will be ventilated in accordance with minimum Code requirements or based on equipment load or based on refrigerant relief.

### **Switch Rooms**

Switch rooms will be ventilated in accordance with minimum Code requirements. Depending on the equipment load, this amount of air may be increased to allow for heat rejection of the equipment, with relief into car park. Alternatively, and for very high equipment loads, an air-cooled split system may be provided for cooling 24/7, with wall mounted indoor unit and condenser unit in the car park.

### **Fire & Sprinkler pump Room**

Fire pump room will be mechanically ventilated to allow for heat rejection from the fire pumps and make up air for combustion for diesel pumps. Final airflow is to be confirmed based on pump selection. Outside air will be ducted from the outside air riser at basement level, and exhaust air will be ducted through a dedicated fire rated riser shaft to atmosphere. Ductwork to be fire rated when crossing outside of the pump room fire compartment; no fire dampers to be installed on supply or exhaust ductwork.

### **Lift Ventilation/Pressurisation**

Lift shafts will not be pressurised. Lift shaft vents shall be located away from exhaust outlet locations by more than 6 metres (less than 6 metres need to be assessed based on the exhaust type and associated flow rates). Lift shaft vents shall be documented by the architect and installed by the builder based on drawings provided by the lift supplier.

### **Carpark Ventilation**

The carpark will be mechanically ventilated with Carbon Monoxide (CO) control to reduce fan speed based on CO sensing. Mechanical exhaust ventilation systems will be provided, and carpark makeup air will be through the perforated roller shutter door. Dedicated exhaust air riser located within the centre of the level shall provide extraction to the car park. Exhaust air ductwork shall be extended where required to ensure sufficient coverage is provided to the car park.

Car park exhaust fan will be located within the Basement carpark. Exhaust air will be discharged at ground level between Buildings A & B through a turret with weatherproof louvres. Exhaust systems will discharge at a, 6m away from any window, natural ventilation opening or mechanical ventilation intake. Carpark exhaust turret to be concealed in coordination with architect and landscaping services.

Non-enclosed apartment storage areas (including bicycle racks) are considered part of the carpark and will not be individually vented. It is assumed that separation of each storage area will be via open steel security mesh which allows free air movement.

## **4.2 ELECTRICAL SERVICES**

The electrical system for commercial areas is designed to operate without the use of on-site fossil fuels. The following bullet points summarise the principal aspects of the Electrical Services proposals

- Substation Coordination
- Main Switchboard
- Diesel Generator standby power
- Consumer mains cabling
- Electrical metering (Private & Authority)
- Power factor correction unit
- Distribution Boards
- Sub-mains cabling
- Solar
- Electric Vehicle Chargers
- General power distribution (i.e. GPOs, permanent electrical connections, power to other trades, etc.)
- Lightning protection
- Provision of space requirement for future tenant generators
- New internal lighting with a focus on architectural and performance lighting
- Intelligent lighting control system
- Emergency and exit lighting
- Private external lighting
- Telecommunications

### **Commercial Distribution**

LV distribution to the retail tenants will be from the retail main distribution board, and will rise up from the basement main switchroom and then reticulate out to each respective tenancy.

The LV distribution to the commercial tenant floors will be via a rising submain located within the tenant electrical riser. The rising cable will feed the on floor meter panel serving individual tenant distribution boards supplying lighting and small power at each level via TP&N tee off units.

## Electrical Metering

Energy meters will be provided to measure the electrical usage of electrical plant loads as necessary to meet the requirements of NABERS, Building Regulations and CIBSE TM39. In line with Section J, separate lighting and power energy meters will also be installed for house distribution boards to monitor energy usage.

Energy meters will also be provided for the feeds to the rising mains serving the commercial tenant loads.

The meters will be monitored by an energy management system (EMS) to allow remote reading, recording, trending etc. The EMS will be an add on to the building management system (BMS) which connects onto the site wide communications network via a dedicated server to allow remote reading.

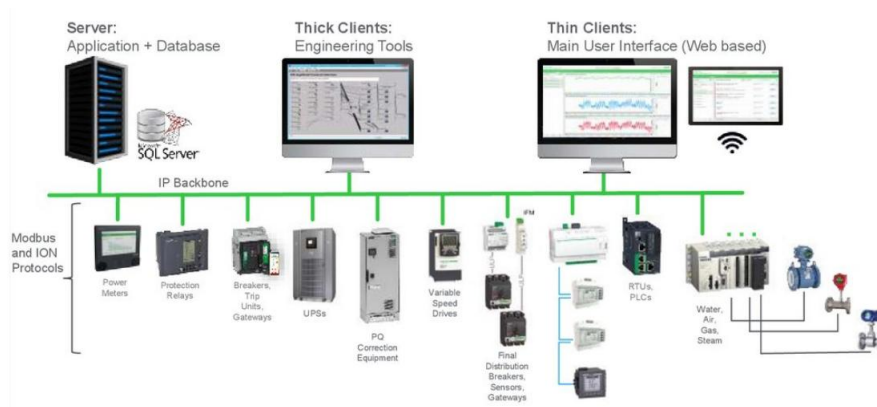


Figure 2: Indicative Metering Topology

Retailer metering shall be provided for the following services:

- All individual tenants (tenant metering)
- All apartments (Authority metering)
- All retail units (Authority metering)
- Landlord services (house metering)

Where solar is installed, the retailer metering shall be configured as bi-directional net metering. Private energy meters complete with CT's will be installed at the following locations:

- All MSBs for bulk site incoming supply metering to enable the Client to monitor site consumption;
- Each Main Distribution Board to monitor consumption;
- Major mechanical plant.

Private digital metering will generally be included on the outgoing supplies for the following load types in accordance with Section J of the NCC:

- Lifts;
- Mechanical Plant;
- Hydraulic Plant;
- Lighting circuits;
- Small general power circuits;
- Solar PV supply;
- All NCC Section J required locations;

## Commercial Tenant Distribution Boards

The rising services will be arranged and sized to be capable to serve up to 3 tenancies per floor.

A tenant electrical riser cupboard/room will be provided on each floor to house the rising bus bar, tee of box, meter/control panel and up to four tenant distribution boards.

The tenant distribution boards will be arranged in a way that the both lighting and power chassis are provided with a load shedding contactor to drop off the non-critical loads in the event of a mains failure.

The distribution boards will be sized based on 1 pole/ 15m<sup>2</sup> for power and 1 pole/ 50m<sup>2</sup> for lighting.

Distribution boards will be fitted with private metering to separately monitor lighting and power consumption as per the requirements of the NCC.

## PV Solar System

20% of the roof area of a building will be left clear for the installation of solar photovoltaic panels to meet NCC 2022 requirements.

Two (2) solar photovoltaic (PV) systems are proposed for this development. One system array per building. Solar panels will be oriented towards north as much as possible to maximize electricity generation during the middle of the day. The solar panels will also be located away from building perimeters and objects which may cause shading.

It is proposed to install as much PV as practically possible without impacting the function of the plant space whilst maintaining reasonable energy production and meeting the NCC requirements.

The solar PV system will be connected back to the main switchboard via a local house distribution board. The voltage rise between the solar PV system and the MSB must be no greater than 2% of the voltage. The solar PV system will interface with the building communications network.



Figure 3: Example Solar PV Panels

## Electrical Vehicle Charges

Electric vehicle chargers are proposed for the development to meet 10% of the provisions on completion, as well as future NCC requirements. EV chargers can be wall mounted within the basement car park.

The basement level will be provided with a dedicated house distribution board to serve the electrical vehicle charger. The distribution board will be sized to support the installation of 7kW units to all of the residential car parking spaces and contain space for all individual circuits to be metered.

A load management system (LMS) be required as part of the installation. The LMS monitors the power consumption of the chargers and limits the impact on the electric installation by distributing the available energy between all the connected vehicles. If the available energy is not enough for all connected vehicles, the system allocates priorities by

turning the charging on and off the vehicles simultaneously. This measure will help limit the maximum demand of the site if a significant number of EV chargers are installed.

All car spaces will have the infrastructure provision in the form of dedicated space for future installation of cable tray.



**Figure 4: Typical Electric Vehicle Chargers (Wall-mounted)**

### **Cable Management Systems**

Cabling within buildings will be reticulated with cable trays or catenary.

Where physically possible, cable trays will be sized to possess a further 50% spare capacity to accommodate future cabling.

Cable trays and major catenary support runs shall be concentrated within corridors and general circulation areas.

All cable trays and catenary supports shall be independently supported from the soffit. There shall be no support from other services. Where cabling is not run on the cable trays it shall be neatly grouped and supported from catenary supports.

Consideration will be given to the grouping of catenary supports to ensure congestion / derating does not occur.

### **Surge Protection**

Surge protection will be provided to protect site equipment from transients and over voltage.

Type 1 Surge protection will be provided at the incoming section within the Main Switchboard. This will be High Discharge capacity.

Type 2 Surge protection will be provided at each Main Distribution board.

Type 3 Surge protection will be provided to circuits feeding Communications rooms and Communications racks.

### **General Power Distribution**

RCD's will be provided to all powerpoint circuits and lighting circuits fed off local distribution boards, in accordance with AS3000. All RCD's will be of the 30mA type, and be integral to the miniature circuit breakers.

GPOs and permanent electrical connections will be generally distributed and co-ordinated with the architectural room layouts.

GPOs will be wired such that some level of flexibility and spare capacity exists for future alterations. In general sub-circuits shall not be equipped with more than 6 double GPOs or 12 single GPOs.

Dedicated circuits will be provide to serve cleaner GPOs spaced no greater than 14m

GPOs shall be either Clipsal (Pro Series) range or approved equal. Final sections will be discussed and presented during detailed design.

## Power And Cabling

Additional GPOs and permanent electrical connections will be provided to suit the needs of specific areas, equipment and other Trades.

Low voltage supplies to the sites mechanical systems will be via mechanical control panels fed directly from the main LV switchboard. Dedicated submains will be provided to mechanical control panels.

Dedicated submains will be provided to lift supplies as required.

All external GPOs will be lockable and weatherproof.

## Lightning Protection

For the purpose of this report and as the design is still at the very early stages a preliminary lightning protection an assessment will be completed for the building to ascertain the necessity of a lightning protection system. In the next stage of the project a detailed assessment will be carried out.

The system will comprise of air termination networks at roof level, down conductors and a connection to the earth termination network. The building will be constructed from concrete columns the reinforcement and a column in cased earth cabling will be utilised as down conductors linking the roof level and terrace lightning protection network with the earth termination points. The reinforced concrete piles and ground floor slab will provide the earth termination points, inclusive of test points which will be installed at basement 8 adjacent to the column.

The Lightning protection system will also be connected to the main earth terminal within the main switch room.

A level of lightning surge protection equipment will be included integral to the main switchboards. The provision of additional protection for tenants' equipment will remain the responsibility of the tenant.

The protection system will be in accordance with the latest version of AS1768.

## 4.3 HYDRAULIC SERVICES

The hydraulic system for commercial areas is designed to operate without the use of on-site fossil fuels.

### Supply Pumps

| Stratum    | Title        | Description/ Performance                                                                                                       | Selected Item                                                        |
|------------|--------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Commercial | Supply Pumps | Duplex (Duty & Stand- by) fixed speed booster pumps complete with control panel and pressure vessel<br><br>Duty 5.0 l/s @ 50mh | Grundfos Hydro MPC-E system with 80 litre pressure vessel on outlet. |

### Potable Hot Water Services

Potable hot water to the commercial office shall be provided from a dedicated centralised electric heat pump plant, located on the roof.

Hot water will be provided from the common plant, via a flow and return loop, to the following areas:

- Base building amenities
- End of trip facilities

## System

| Area              | Title                                    | Description/<br>Performance                                  | Selected Item                                                                                                                         |
|-------------------|------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Commercial Office | Hot Water Plant-<br>Base build amenities | External heat pump hot water plant                           | Air to Water Heat Pump heaters, complete with Stainless Steel Storage Cylinders                                                       |
|                   | Secondary Hot Water Circulating Pumps    | Secondary circulating system to maintain +- 5°C within loop. | Dual Grundfos UPS 32-80B (Duty & Stand-by), complete with control panel.<br><br>Pumps shall operate alternatively on a 24 hour basis. |
|                   | Tempering Valves                         | Regulate temperature to all sanitary fixtures                | Caleffi series 5213                                                                                                                   |
| Carpark           | Garbage Rooms                            | Instantaneous electric 3 phase hot water unit                | Stiebel Eltron DHE 27 AU                                                                                                              |

## Natural Gas

Gas will not be provided for this project

## Tenancy - COMMERCIAL office area

The table below provide an overview of the hydraulic services provide to the Commercial Office Area

| Service              | Description                                                                                                | Provisions                                                                                                                         |
|----------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Sewer Drainage       | Gravity drainage to discharge to connection point                                                          | Gravity connection to base building amenities<br><br>Provisional stack within floor plates to allow coverage to 80% of floor plate |
| Trade Waste Drainage | No Applicable                                                                                              | No Provisions                                                                                                                      |
| Potable Cold Water   | Supply via commercial stratum meter and booster pumps                                                      | 1 x capped Ø25mm point within core for future extension by tenant                                                                  |
| Potable Hot Water    | Centralised electric heat pump hot water plant to serve End of Trip facilities and base building amenities | No tenancy provisions                                                                                                              |

## 4.4 FOSSIL FUEL FREE SITE

Based on the information provided, the proposed development is 100% fossil fuel-free. No current on-site mechanical, electrical, or hydraulic equipment utilizes fossil fuels. Furthermore, there is no evidence to suggest that the development will require fossil fuels for its operation after occupancy. As such, the proposed development fully complies with the Environmental Planning and Assessment Act Regulation amendments, 35C(2).

## 5. ENERGY EFFICIENCY DESIGN FEATURES

### 5.1 SUSTAINABLE DESIGN FRAMEWORK

The sustainable design framework for this development aims to incorporate the best practice design initiatives and ESD principles into the development. The ESD initiatives and targets outlined within this framework have been compiled based on the following:

- National Construction Code (NCC) 2022 Section J – Energy Efficiency
- Green Star Buildings v1 (Equivalency)
- Sustainability Standards for Residential Development (BASIX)
- Sustainability Standards for Non-Residential Development

These ESD initiatives and targets are to be incorporated into the design of the project during the detailed design by the design team.

#### NCC 2022 Section J Energy Efficiency

The objective of NCC Section J is to reduce greenhouse gas emissions in the built environment. The current version of construction code is NCC 2022, which became mandatory on 1 May 2023, is significantly more stringent than the previous version of NCC and as such will deliver more energy efficient buildings. Section J comprehensively covers all major factors that will impact a building energy usage, including building fabric, building sealing, air-conditioning & ventilations systems, artificial lighting & power, heated water supply & swimming pool plant and facilities for energy monitoring. For the proposed development, Section J is applicable to the Class 3 tourist and visitor accommodation building and the retail/commercial portions of the development.

#### NABERS

NABERS is a sustainability rating for the built environment. It provides a one-to-six star rating system for building efficiency across energy, water, waste, and indoor environment, akin to the star rating on your household appliances such as fridge or washing machine. This annual certification model is designed to help building owners benchmark their building's performance and understand how it compares to similar buildings. NABERS has also partnered with Climate Active and can be used to achieve a Carbon Neutral certification. In summary, NABERS accurately benchmarks and communicates the environmental performance of buildings and help identify opportunities for operational savings and improvements.

#### Green Star

The project team has benchmarked the mixed-use development against the Green Star Buildings v1 rating system.

For the purpose of benchmarking, a Green Star scorecard has been prepared (attached as Appendix A), which lists the sustainability initiatives targeted for this project. The below table summarises the outcomes of the Green Star benchmarking assessment. Points are calculated as per the official Green Star Buildings v1 Scorecard. For a 4-star rating, the mixed-use development needs to achieve a minimum of 15 points and all the "minimum expectation".

The proposed mixed-use development will target a minimum of 23 points, giving the project a buffer of 8 points if some points become infeasible due to unforeseen factors. Please note that the project is going for Green Star Buildings v1 equivalency and not formal certification.

| Category    | Points Targeted |
|-------------|-----------------|
| Responsible | 2               |
| Healthy     | 7               |
| Resilient   | 2               |
| Positive    | 3               |
| Places      | 3               |

|                            |                                                     |
|----------------------------|-----------------------------------------------------|
| People                     | 3                                                   |
| Nature                     | 3                                                   |
| Leadership                 | 0                                                   |
| Total Score                | All " <i>Minimum Expectations</i> " met + 23 Points |
| Buffer in Achieving 4-Star | 8 Points                                            |

## 5.2 ENERGY EFFICIENCY INITIATIVES

### Building Envelope

Intelligent design and material selection ensure that thermal comfort is not entirely achieved by mechanical means. Passive design initiatives such as performance glazing, shading and the use of insulation will reduce demand on mechanical air conditioning systems resulting in a reduction in energy consumption and greenhouse gas emissions.

### Building Envelope Performance

The building fabric will be designed to meet or exceed the NCC 2022 Section J and BASIX requirements for the building envelope. Thermal breaks will be incorporated into walls, floors, and roofs where appropriate to ensure a continuous thermal barrier on the building envelope, reducing the flow of thermal energy between conductive materials.

### Shading And Daylighting

Solar access can enhance indoor environmental quality through access to daylighting and reduce lighting energy consumption. However, excessive solar access and hence, direct solar radiation heat can increase HVAC energy demand and can also cause thermal discomfort. The passive solar heating principle which aims to prevent solar heat gain in the summer and harvest it in the winter for a free source of heating, and the Passive cooling principle which prevents heat from entering the building during the summer months, are strategies that can conveniently take advantage of the site-specific solar access for optimised indoor environmental quality and reduction of HVAC energy demand through the use of tailored shadings.

The proposed building is to be designed to make the best use of the sun by using external high-performance horizontal eave shading to prevent the high summer sun from entering the building whilst allowing the low winter sun to enter the building for passive heating.

These passive design features allow for enriched daylighting and greater access to external views for occupants. Additional daylighting reduces the reliance on artificial light and benefits alertness, mood, and productivity. External views provide a connection to nature and the building and help to create an environment encouraging constructive experience.

### Heating, Cooling and Ventilation Systems

The air-conditioning and ventilation systems shall be designed to comply with and exceed the minimum requirements of NCC 2022 Section J6 requirement.

The occupied spaces will be having high-efficiency air conditioning as required. An air-cooled heat rejection system is to be used as this will help minimise the impacts associated with harmful microbes (e.g., Legionella impact).

All bathrooms/toilets, laundries (if any), and general exhaust are to be naturally ventilated where possible, with mechanical ventilation required where necessary. The design will have a sufficient amount of exhaust fans to ensure liveability for the building users.

The control of the air conditioning system shall be designed to minimise energy consumption. Further, high-efficiency equipment for the HVAC system will be selected to assist with the energy conservation of the building.

Ductwork systems will be designed to reduce system pressure losses to reduce fan motor power. This includes the selection of equipment for reduced coil and fittings drops and being generous with ductwork sizes to reduce friction losses.

## Lighting

Lighting is to be designed to comply with NCC 2022 Section J7. Also, the Lighting illumination density is to be according to NCC2022 Section J7D3. Fittings incorporating the latest lamp technologies to be installed to minimise energy use and provide efficient artificial lighting systems. The proposed development shall be illuminated using LED fittings and be controlled via PIR occupancy sensors.

Lighting in regularly occupied spaces shall be provided with a daylight sensor (PE Cells) to reduce light output or turn off lights when sufficient daylight is provided within the space. For large spaces, perimeter lighting shall be designated in a separate zone to make maximum use of daylight.

All the external luminaires proposed will be according to AS 4282:1997. This will make sure that the external luminaires do not emit light pollution to the night sky above a given benchmark.

## Controls

All HVAC installed shall be controlled by the HVAC group controller. Closed spaces such as storage rooms and cleaners' cupboards are to be provided with a wall switch. For BOH areas (not task-specific areas) PIR sensors are to be provided. Voltage control (dimming) should be provided where appropriate.

## Electricity Metering

Electricity metering and sub-metering shall be specified in accordance with Section J to monitor and manage electricity consumption in the building. Sub-metering is to be provided to distinct locations (e.g., warehouse usage, mech plant and PV generation)

## Photovoltaics

Collecting solar energy has been chosen as a key ESD strategy for the project, with an aspirational goal of reducing the building's energy consumption and greenhouse gas emissions from a renewable source via the provision of a roof-mounted photovoltaic system.

To further reduce the energy footprint of the development, the project will consider solar photovoltaics (PV) panels on the roof to generate and provide renewable electricity to the development.

## Indoor Air Quality

The quality of indoor air has a significant impact on our health and environment. Poor indoor air quality results in adverse health effects such as allergies, asthma, etc. The ventilation system shall be designed to minimise the entry of outdoor pollutants as per ASHRAE Standard 62.1:2013 and should comply with AS1668.2:2012.

## 6. ESTIMATED ENERGY CONSUMPTION AND EMISSIONS

An estimate of the building energy use over a 12 month period and the associated greenhouse gas intensity has been undertaken based on NABERS Office Base Building Energy Rating methodology. The result of this estimate has been used to inform the potential NABERS Office Base Building Energy Rating that can be achieved.

The following building details are used for the rating

- Total net lettable area 4,321.9 m<sup>2</sup>
- Standard business hours of the building 40 hour/week

### 6.1 FLOOR AREA CALCULATION

Under NABERS Rules the size of the building is measured through its Rated Area. Therefore, as a starting point the total net lettable area (NLA) was calculated in compliance with the Measurement Standard for Rated Area.

| Levels | Usage                                           | NLA (m <sup>2</sup> ) |
|--------|-------------------------------------------------|-----------------------|
| B      | Café Restaurant, Kitchen and Commercial Lobby   | 375.9                 |
| GF     | Café Restaurants, Kitchens and Commercial Lobby | 898.9                 |
| L1     | Office and office support facilities            | 1,413.3               |
| L2     | Commercial Offices                              | 659.9                 |
| L3     | Commercial Offices                              | 402.3                 |
| L4     | Commercial Offices                              | 413.9                 |
| L5     | Commercial Office                               | 157.8                 |
| Total  |                                                 | 4,321.9               |

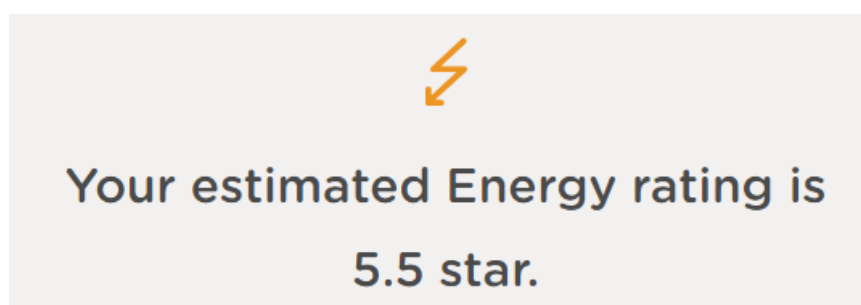
In accordance with the rules, the Basement Level end-of-trip facility, Ground Floor Retail and unisex bathrooms and corridors for Levels 1-5 areas has been excluded from the Rated Area calculation as it is not fit for office use.

### 6.2 ESTIMATED ENERGY CONSUMPTION

- Total Estimated Grid Electricity Consumption: 215,272 kWh/annum
- Total Estimated Gas Energy Consumption: 0 MJ/annum
- Total Estimated Oil Energy Consumption: 0 L/annum
- Total Estimated Energy Intensity: 199.2 MJ/m<sup>2</sup>
- Scope 1 and 2 Total Emissions: 162,649 kgCO<sub>2</sub>-e p.a.

### 6.3 PREDICTED NABERS RATING

The results show that the building is predicted to achieve a 5.5 Star NABERS Office Base Building Energy rating.



## CONCLUSION

A Net Zero Statement has been prepared for the proposed mixed-use development located at 2-14 Vine Street, 16-30 Vine Street and 32-34 Eveleigh Street, Redfern NSW 2016 to demonstrate that it is compliant with the Net Zero Provisions of the Sustainable Buildings SEPP.

The development is designed to operate without the use of on-site fossil fuels. The project is exploring the integration of renewable energy sources such as solar panels, discussing integrated energy-efficient designs and including energy consumption and emissions calculations to further reduce its environmental impact.

Specifically, this Net Zero Statement has addressed all the below requirements in accordance with Clause 35C of the Sustainable Buildings SEPP:

| Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Evidence                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| <p>2) The development application must include evidence that the development—</p> <ul style="list-style-type: none"><li>a) will not use on-site fossil fuels after the occupation and use of the development commence, or</li><li>b) incorporates the infrastructure, or space for the infrastructure, necessary for the development to not use on-site fossil fuels after 1 January 2035.</li></ul> <p><b>Note</b> — Infrastructure includes plant, equipment and ventilation.</p> | <p>Section 4</p> <p>Section 5</p> <p>Section 6</p> |
| <p>3) The development application must include details of the following—</p> <ul style="list-style-type: none"><li>a) any renewable energy generation and storage infrastructure forming part of the development,</li><li>b) passive and technical design features that minimise energy consumption by users of the development.</li></ul>                                                                                                                                          | <p>Section 5</p>                                   |
| <p>4) The development application must include the following information if available—</p> <ul style="list-style-type: none"><li>a) the estimated annual energy consumption for the building in kilowatt hours per square metre of floor area,</li><li>b) the estimated amount of emissions relating to energy use in the building, including direct and indirect emissions.</li></ul>                                                                                              | <p>Section 6</p>                                   |

Hence, a compliant Net Zero Statement has been provided for the proposed development. The evidence presented in this report has been certified by a mechanical, as shown in Section 2 of this report, in accordance with Clause 35C(5) of the Sustainable Buildings SEPP.